Tampa (28th); 68, Corpus Christi (17th). The lowest minima were: 33, Idaho Falls (11th); 34, Baker City (10th); 36, Lander (11th), Northfield (3d); 37, Sault Ste. Marie (2d), Roseburg (10th), Pysht and East Clallam (13th).

The *years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Yuma, 117; Walla Walla, 105; Palestine, 100; Roseburg, 98; Idaho Falls, 91; San Diego, 89; Port Angeles, 83. The minimum temperatures were the lowest on record at: Meridian, 58; Idaho Falls, 33.

The greatest daily range of temperature and data for computing the extreme and mean monthly ranges are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: Miles City, 49; Lander, Pueblo, Idaho Falls, Port Crescent, Roseburg, and San Luis Obispo, 46; North Platte, Havre, and Winnemucca, 44. The smallest values were: Hatteras, 14; Key West and Tatoosh Island, 16; Jupiter and Galveston, 17; Kittyhawk, Point Reyes Light, and Eureka, 18; Block Island, 19; Wilmington, and Corpus Christi, 20. Among the extreme monthly ranges the largest were: Walla Walla and Roseburg, 61; San Luis Obispo, 60; Fresno, 59; Idaho Falls and Dodge City, 58; Miles City, 57; Spokane and Baker City, 56. The smallest values were: Galveston and Hatteras, 17; Key West, 18; Jupiter, 19; Eureka, 20; Port Eads, 21; Tatoosh Island, 23.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
Middle Atlantic	+ 2.3	+ 0.4	New England	− 1.2	− 0.2
South Atlantic	+ 8.1	+ 1.4	Florida Peninsula	− 9.7	− 1.6
West Gulf	+ 7.8	+ 1.3	East Gulf	− 1.2	− 0.2
Ohio Valley and Tenn.	+ 9.5	+ 1.6	North Pacific	− 3.7	− 0.6
Lower Lake	+ 9.9	+ 1.6	Middle Pacific	− 0.8	− 0.1
Upper Lake	+20.5	+ 3.4			
North Dakota	+ 9.7	+ 1.6			
Upper Mississippi	+20.9	+ 3.5			
Missouri Valley	+20.3	+ 3.4			
Northern Slope	+10.0	+ 1.7			
Middle Slope	+22.2	+ 3.7			
Abilene (southern Slope)	+22.0	+ 3.7			
Southern Plateau	+ 7.7	+ 1.3			
Middle Plateau	+ 2.1	+ 0.4			
Northern Slope	+12.6	+ 2.1			
South Pacific	+ 4.8	+ 0.8			

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effects of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

Measurements of evaporation within the thermometer shelters are difficult to make so as to be comparable at temperatures above and below freezing, and may be replaced by computations based on the wet-bulb temperatures. The absolute amount of evaporation from natural surfaces not protected from wind, rain, sunshine, and radiation, are being made at a few experimental stations and will be discussed in special contributions.

Sensible temperatures.—The sensation of temperature experienced by the human body and ordinarily attributed to the condition of the atmosphere depends not merely on the temperature of the air, but also on its dryness, on the velocity of the wind, and on the suddenness of atmospheric changes, all combined with the physiological condition of the observer. A complete expression for the relation between atmospheric conditions and nervous sensations has not yet been obtained.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month was heaviest in Florida and heavy in small areas within Missouri, Alabama, Louisiana, and the western part of North Carolina. It was least, viz, 0.00 in Central California and the adjacent portions of Nevada and Arizona.

The larger values at regular stations were: Tampa, 13.4; Pensacola, 12.5; Jacksonville, 9.4; Jupiter, 8.9; New Orleans, 8.2; Charleston and Meridian, 7.6; Mobile, 7.2.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess at many stations on the Atlantic Coast as also generally in Florida, southern Georgia, Alabama, Mississippi, and western Louisiana. Elsewhere it was generally deficient. The large excesses were: Mobile, 7.1; Tampa, 6.5; Galveston, 4.5; Yarmouth, 4.4; Norfolk, 3.7; Detroit, 3.3; New York, 3.2. The large deficits were: Omaha, 3.8; Palestine, 3.5; Kansas City, 2.9; Fort Smith, 2.8; Des Moines, 2.7.

The *average departure* for each district is also given in Table I. By dividing these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100):

Above the normal: Middle Atlantic, 119; Florida, Peninsula, 144; east Gulf, 129; Lower Lake, 103.

Normal: Southern Plateau, 100.

Below the normal: New England, 97; south Atlantic, 92; west Gulf, 39; Ohio Valley and Tennessee, 83; upper Lake, 60; lower Lake, 76; upper Mississippi, 76; Missouri Valley, 71; northern Slope, 70; middle Slope, 84; southern Slope, (Abilene), 66; middle Plateau, 27; northern Plateau, 65; north Pacific, 85; middle Pacific, 20; south Pacific, 0.00.

The years of greatest and least precipitation for June are given in the REVIEW for June, 1890. The precipitation for the current month was the greatest on record at: Vineyard Haven, 3.59; Meridian, 7.55; Tampa, 13.42. It was the least on record at Northfield, 1.62; Nashville, 1.82; Palestine, 0.71; Pueblo, 0.35.

The total accumulated monthly departures from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
North Dakota	+ 3.00	129	New England	— 3.60	84
Missouri Valley	+ 0.20	101	Middle Atlantic	— 1.00	95
Middle Plateau	+ 1.70	123	South Atlantic	— 5.20	80
North Pacific	+ 5.30	116	Florida Peninsula	— 0.10	99
Middle Pacific	+ 2.70	114	East Gulf	— 4.50	82
			West Gulf	— 6.20	73
			Ohio Valley and Tenn.	— 6.70	74
			Lower Lakes	— 0.30	98
			Upper Lakes	— 2.40	85
			Upper Mississippi	— 0.70	96
			Northern Slope	— 0.40	95
			Middle Slope	— 2.60	79
			Abilene (southern Slope)	— 6.90	48
			Southern Plateau	— 0.80	70
			Northern Plateau	— 0.80	92
			South Pacific	— 1.90	76

Details as to *excessive precipitation* are given in Tables XII and XIII.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 1, 2, 22, 26. Arizona, 20, 25, 29, 30. Arkansas, 1, 2, 8, 17, 21. Colorado, 2, 5, 6, 9, 10, 19 to 25, 28, 30. Georgia, 1, 4, 10, 16. Idaho, 1, 2, 3, 5, 8, 15, 17, 18, 27, 29, 30. Illinois, 6, 7, 8, 17, 19, 24, 27. Indiana, 3, 4, 8. Iowa, 5, 6, 7, 16, 20, 23, 24, 25, 27, 28. Kansas, 1, 3, 4, 6, 16, 17, 18, 20 to 25, 27. Kentucky, 5, 8, 12, 16, 17. Maine, 11, 18. Maryland, 16. Massachusetts, 21. Michigan, 2, 5, 7, 14, 25. Minnesota, 4, 5, 6, 18, 24, 26, 27. Mississippi, 1, 16. Missouri, 1, 6, 7, 17, 21, 22, 23, 25. Montana, 3, 4, 17, 22, 23. Nebraska, 3 to 7, 16, 19, 20, 21, 24 to 27, 30. New Hampshire, 11, 21. New Jersey, 9, 18, 21. New Mexico, 22, 25, 28. New York, 14. North Carolina, 9, 13. North Dakota, 2, 15, 16, 20, 21, 27. Ohio, 3, 6, 7, 11, 13, 14, 15, 25. Oklahoma, 7. Oregon, 5, 9, 16, 29, 30. Pennsylvania, 16, 17, 20. South Dakota, 4, 6, 10, 14 to 17, 20, 22, 29, 30. Tennessee, 1, 15. Utah, 1, 2, 3, 16, 22, 29. Virginia, 15, 18. Wisconsin, 6, 7, 14, 15, 18, 19, 24, 25, 27. Wyoming, 17, 18, 23, 24.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends upon the absorption by the atmosphere, and varies largely with the distribution of cloudiness. The sunshine is now recorded automatically at 17 regular stations of the Weather Bureau by its photographic, and at 23 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time; for convenience the results are all given in Table XI for each hour of local mean time.

Photographic and thermometric registers give the duration of that intensity of sunshine which suffices to make a record, and, therefore, they generally fail to record for a short time after sunrise and before sunset, because, even in a cloudless sky, the solar rays are then too feeble to affect the self-registers. If, therefore, such records are to be used for determining the amount of cloudiness, they must be supplemented by special observations of the sky near the sun at these times. The duration of clear sky thus specially determined constitutes the so-called twilight correction (more properly a low-sun correction), and when this has been applied, as has been done in preparing Table XI, there results a complete record of the clearness of the sky from sunrise to sunset in the neighborhood of the sun. The twilight correction is not needed when the self-registers are used for ascertaining the duration of a special intensity of sunshine, but is necessary when the duration of cloudiness is alone desired, as is usually the case.

The average cloudiness of the whole sky is determined by numerous personal observations at all stations during the daytime, and is given in the column "average cloudiness" in Table I; its complement, or percentage of clear sky, is given in the last column of Table XI.

COMPARISON OF DURATIONS AND AREAS.

The sunshine registers give the *durations* of effective sunshine whence the duration relative to possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have no necessary relation to each other, since stationary banks of clouds may obscure the sun without covering the sky, but when all clouds have a steady motion past the sun and are uniformly scattered over the sky, the percentages of duration and of area agree closely. For the sake of comparison, these percentages have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental records of percentages of durations of sunshine are almost always larger than the observers' personal estimates of percentages of area of clear sky; the average excess for June, 1896, is 12 per cent for photographic and 16 per cent for thermometric records.

The details are shown in the following table, in which the stations are arranged according to the greatest possible duration of sunshine, and not according to the *observed* duration as heretofore.

Difference between instrumental and personal observations of sunshine.

Stations.	Apparatus.	Total possible duration for the whole month.	Personal estimated area of clear sky.	Instrumental record of sunshine.			
				Photographic.	Difference.	Thermometric.	Difference.
		Hrs.	%	%	%	%	%
Bismarck, N. Dak.	P.	475.6	60	67	+ 7	.....	.....
Helena, Mont.	P.	475.6	68	71	+ 3	.....	.....
Portland, Oreg.*	T.	471.7	61	.....	.....	61	0
	P.	471.7	61	62	+ 1	.....	.....
Eastport, Me.	P.	466.7	45	60	+15	.....	.....
Minneapolis, Minn.	T.	466.7	.....	.....	.....	73	.....
Northfield, Vt.	P.	463.5	37	51	+14	.....	.....
Portland, Me.	T.	463.5	38	.....	.....	60	+22
Rochester, N. Y.	T.	459.9	67	.....	.....	74	+ 7
Buffalo, N. Y.**	T.	459.9	.....	.....	.....	.....	.....
Boston, Mass.	T.	456.2	52	.....	.....	57	+ 5
Chicago, Ill.	T.	456.2	63	.....	.....	84	+21
Cleveland, Ohio	P.	456.2	50	63	+13	.....	.....
Des Moines, Iowa.	T.	456.2	39	.....	.....	61	+22
Detroit, Mich.	T.	456.2	61	.....	.....	70	+ 9
Dubuque, Iowa	T.	456.2	45	.....	.....	71	+26
Eureka, Cal.	P.	451.9	57	58	+ 1	.....	.....
New York, N. Y.	T.	451.9	50	.....	.....	51	+ 1
Salt Lake City, Utah.	P.	451.9	49	83	+34	.....	.....
Colorado Springs, Colo.	T.	449.0	44	.....	.....	54	+10
Denver, Colo.	P.	449.0	50	67	+17	.....	.....
Philadelphia, Pa.	T.	449.0	37	.....	.....	67	+30
Baltimore, Md.	T.	445.9	37	.....	.....	45	+ 8
Cincinnati, Ohio	T.	445.9	57	.....	.....	81	+24
Kansas City, Mo.	P.	445.9	46	56	+10	.....	.....
St. Louis, Mo.	T.	445.9	49	.....	.....	71	+22
Washington, D. C.	P.	445.9	44	51	+ 7	.....	.....
Dodge City, Kans.	P.	443.1	64	80	+16	.....	.....
Louisville, Ky.	T.	443.1	45	.....	.....	73	+38
San Francisco, Cal.	T.	443.1	70	.....	.....	77	+ 7
Santa Fe, N. Mex.	P.	437.2	64	79	+15	.....	.....
Little Rock, Ark.	T.	434.3	48	.....	.....	77	+29
Atlanta, Ga.	T.	431.5	60	.....	.....	78	+18
Wilmington, N. C.	T.	431.5	38	.....	.....	48	+10
Phœnix, Ariz.	P.	428.7	87	98	+11	.....	.....
San Diego, Cal.	P.	428.7	58	60	+ 2	.....	.....
Savannah, Ga.	P.	425.8	29	58	+29	.....	.....
Vicksburg, Miss.	T.	425.8	70	.....	.....	77	+ 7
New Orleans, La.	T.	420.9	62	.....	.....	62	0
Galveston, Tex.	P.	419.0	82	88	+ 6	.....	.....

*Record by both methods. **Record incomplete.

WIND.

The *prevailing winds* for June, 1896, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.